ART. XXI.—*Descriptions of some new Genera and Species of Australian Polyzoa; to which is added a List of Species found in Victoria.* By P. H. MACGILLIVRAY, A.M., M.R.C.S.

[Read 26th November, 1868.]

In the present paper are given descriptions of forty-eight Species, including two Genera, of Australian Polyzoa, which cannot be satisfactorily referred to any of those hitherto described. The identification of Polyzoa by the aid of descriptions alone, however accurate these may be, is often extremely difficult. The species here described, as well as the others existing in Victoria, will be figured in Professor M'Coy's "Memoirs of the Museum," where I hope to be able to give descriptions of all those with which I am acquainted. Specimens will also be deposited in the National Museum. I have added a list which contains all the Victorian species I have in my collection, with the exception of a few not yet determined.

Family CATENICELLIDÆ.

Genus CATENICELLA, *Blainville.*

C. rufa.

Cells vase-formed; lateral processes small, pointed. Front of cell pierced by numerous round fenestræ, the circumferential being the largest; mouth with a notch in the lower lip. On the back of the cell an elevated band runs up the middle, sending a narrow branch horizontally to each lateral process, and a small band extends up each side. Ovicells large, cribriform, surmounted by two avicularia.

Common, forming handsome reddish-brown tufts, four or five inches high.

The only species with which this can be confounded is *C. cribraria*, Busk, from which, however, it is easily distinguished. In *C. cribraria*, the lower lip is entire, and there is a crescentic pore a short distance beneath it; and the back is smooth and destitute of any special marks. In *C. rufa*, instead of the suboral pore, the centre of the lower lip presents a constant notch; the avicularian processes are small and pointed, and the back of the cell is occupied by a broad mesial band,

connected inferiorly with two narrow lateral ones, and sending off superiorly, on each side, a narrow band to join the lateral in the avicularian processess. The ovicell of *C. rufa* is very large, cribriform and surmounted by two avicularia. I am unacquainted with that of *C. cribraria.*

C. intermedia.

Cells large, wide ; mouth vertical, or nearly so ; front of cell with five large fenestræ ; lateral processes very wide, usually abortive on one side ; back of cell smooth.

Queenscliff.

From *C. plagiostoma*, to which it is closely allied, it may be distinguished by the following characters: The mouth is straight or nearly so ; the anterior foramina, although arranged in the same manner, are of smaller size ; there are none of the peculiar enormous spoon-shaped avicularia of *C. plagiostoma ;* the back also is smooth. The large size of the foramina, and the very wide lateral processes sufficiently distinguish it from *C. ventricosa*, Busk, the only other species with which it can be confounded. The large lateral process, with its tolerably large avicularium, usually exists only on one side of the cell.

C. Hannafordi.

Cells wide, ovoid or sub-globular. Lateral processes large, gaping, directed forwards, usually equal on both sides. Vittæ narrow, entirely lateral, extending the whole length of the cell. Anterior surface smooth or very finely papillose ; posterior surface faintly sulcate.

Lady Bay, Portland, adhering to Algæ—Mr. S. Hannaford.

This species may be distinguished from all the others by the large gaping avicularian processes, directed a good deal forwards, and almost surrounding the mouth, and the narrow, entirely lateral vittæ. Its closest ally is *C. ringens*, which has not hitherto been found in Victoria, and of which I have not seen specimens.

Family CELLULARIIDÆ.

Genus EMMA, *Gray.*

E. cervicornis.

Cells two in an internode ; internodes connected by short double tubes ; aperture armed with five or six spines, of which the two outer are long and pod-like ; opercular spine ranched, projecting upwards and outwards from the inner

and lower angle; lower part of cell-aperture filled in by a calcareous tubercular plate; a large avicularium on the outside of each cell immediately below the aperture.

Parasitic on other polzyoa and algæ.

Of the genus *Emma*, four other species are of common occurrence in Australia. Of these *E. tricellata*, Busk, and *E. (Menipea) Buskii*, Wyv. Thomson, are at once distinguished from the present by having three cells in an internode. *E. (Menipea) Cyathus*, W. Thomson, and *E. crystallina*, Gray, agree in having only two cells; in the former, however, the connecting tube is very long and single, while in the latter, in which it is double, there is no opercular spine.

Family SALICORNARIIDÆ.

Genus SALICORNARIA, *Cuvier.*

S. hirsuta.

Cells in the same series contiguous; surface granular; mouth central, lower lip arched upwards, usually with a minute denticle at either side internally; a long corneous tubular process from the base of the cell. Avicularium replacing a cell, mandible very large, semicircular.

Common.

This species forms bushy tufts one to two inches high, of a dirty-white colour. The cylinders frequently present, towards the superior extremity, swollen portions corresponding to the situation of the immersed ovicells. The form of the cell varies extremely, being hexagonal, rhomboidal, with upper and lower edges straight, or the upper arched or pointed; frequently the upper end is arched, and the lower part much contracted. The forms of cell are precisely similar to those described as occurring in *S. farciminoides* and *S. sinuosa*. At the base of each cell there is generally a long, hollow, corneous process; in some specimens each cell has two; and occasionally they are wanting, but never from all the cells of a polyzoary. The ovicell is totally immersed, situated at the swollen part of a cylinder; the opening is widely lunate, at the summit of an ordinary cell. The avicularium is of great size. It takes the place of a cell in a series; it is larger than the adjacent cells, of a similar form, granular on the surface; the mandible is very large, semicircular, occupies about a third of the cell, and from its situation and form very much resembles the moveable lip of an enormous mouth.

Family BICELLARIIDÆ.

Genus BICELLARIA, *Blainville.*

B. turbinata.

Cells elongated, much contracted below ; opening circular or nearly so, directed obliquely upwards and forwards ; usually four long, submarginal spines.

Queenscliff, a single specimen.

The general appearance of this species is very much that of *B. grandis*, Busk, from which, however, and *B. Tuba* it is readily distinguished. It differs from the former in the shape of the cell and direction of its opening, which is nearly round, and looks upwards and forwards, and from the latter in the absence of the peculiar spine-bearing process from the outer margin. In the more perfect cells, there are generally four, long, hollow, articulated, submarginal processes, of which two arise almost together from the outer part, one from the upper edge, and the fourth, longer and directed more vertically, from the anterior edge. The aperture is usually occupied by a thin membrane, in the outer half of which is the semi-circular mouth.

Genus BUGULA, *Oken.*

B. robusta.

Cells biserial, contracted below, upper and outer angle produced into a short, hollow conical process ; aperture oval, not extending to the base. A large avicularium on the lower part of the cell, below and to the outside of the aperture.

Western Port.

Of this species I have a tuft nearly two inches high. It is of a greyish-brown colour. It is readily distinguished from the other described species. The cells are large, the whole outer angle produced into a stout, conical process ; the inner angle is rounded, and has no spine or prolongation. The aperture does not extend to the base ; and on the entire part of the cell, to the outside and below the level of the aperture, is a large pedunculate, avicularium. I have not seen ovicells.

Family HIPPOTHOIDÆ.

Genus HIPPOTHOA, *Lamouroux.*

H. crassa.

Cells large, much attenuated downwards, surface not carinate ; opening large, margin thickened, a thick lip-like projection from the lower border. Connecting tubes short.

On stones and algæ.

This species is closely allied to *H. catenularia,* from which it differs in the thick projection from the lower margin of the mouth.

H. distans.

Cells small, carinate, smooth or longitudinally striated ; mouth small, lower lip entire ; connecting tubes very long, slender and annulated. Ovicell small, projecting from the upper part of a cell.

On stones and algæ.

This species is at once recognised by the small size of the cells, the entire or slightly projecting lower lip of the small roundish mouth, and the great length of the slender connecting tubes which are usually many times the length of the cell. The ovicell projects from the upper part of a terminal cell, resembling a prolongation upwards, and has a short, obtuse conical process above or in front.

Genus ALYSIDOTA, *Busk.*

A. ciliata.

Cells ovate or pyriform ; front smooth ; mouth with four to six spines ; a small lunate pore below the mouth. Ovicell adpressed to the cell above, globular, smooth, grooved above.

A single small specimen on a fragment of Bicellaria.

Family MEMBRANIPORIDÆ.

Genus MEMBRANIPORA, *Johnston.*

M. Woodsii.

Cells oblong, arranged in longitudinal and transverse series ; margins raised ; mouth large, arched above, concave below, with a blunt hollow spine on either side. Avicularium at the base of a cell, mandible broadly triangular, with the angles rounded.

Portland bay, on algæ—Rev. J. E. T. Woods.

In this species, the horizontal rows of cells diverge obliquely from a mesial line. It may be distinguished from

M. mamillaris by the cells being arranged in transverse series instead of being alternate and by the different form of the avicularium; and from the following species by the cells being of uniform size, by the hollow lower lip of the mouth, and by the oral spines, although frequently differing in size, not presenting the same great disproportion.

M. dispar.

Cells oblong, of two sizes, arranged in concentric series, a row of large cells being followed by two rows of short; margins raised; mouth arched above, straight below; a thick, blunt, hollow spine on each side of the mouth, in the large cells of enormously disproportionate size.

Portland Bay, on algæ—Rev. J. E. T. Woods.

The characters of this species are so peculiar that it is impossible to confound it with any other. The cells are of two sorts, the one form about twice the length of the other. One row of long cells is succeeded by a double row of short ones. In the short cells, the oral processes are of nearly equal size, while in the long ones there is on one side of the mouth a small or moderate sized spine, and on the other a large bullate process.

M. armata.

Cells elongated, quadrate, separated by raised margins; aperture entirely filled in by a thin, granular membrane; mouth with a thick hollow process on each side. Avicularia large, usually at the base of a cell, mandible pointed directly upwards.

On algæ, Port Phillip.

M. serrata.

Cells quadrate, very much elongated, truncate above and below; from each side of the margin projecting inwards is a series of short processes expanding and dividing at the ends. Avicularium at the base of a cell, mandible very long. Ovicell small, projecting into the base of the cell above.

Encrusting a sponge, Snapper Point.

At once distinguished from all other species by the curious marginal processes, which bear some resemblance to those found in some forms of *Flustra denticulata*, of which, were it not for the absence of the characteristic minute denticles and the much longer and narrower mandible of the avicularium, it might be supposed to be a single layer.

M. falcata.

Cells obscurely hexagonal, separated by raised beaded margins; front in great part filled in by a tubercular calcareous plate. Avicularia scattered irregularly, replacing a cell, mandible large, falciform. Ovicell small, round, granular.

Snapper Point, on a mussel shell.

M. ciliata.

Cells broadly ovate, separated by narrow raised margins; front of cell almost entirely occupied by a calcareous, granular, membrane; a series of (4–7) long, hollow spines articulated round the upper end of the cell.

On Algæ, frequent.

This very peculiar species occurs in small patches on algæ. The cells are irregularly arranged, separated by narrow raised margins; the greater part of the front is occupied by a calcareous tubercular plate, the upper margin of which has a thickened rim; the aperture left is small, and from the size and shape and the arrangement of the spines, might readily be mistaken for a mouth with a straight thick lower lip. Round the margin of the cell opposite the aperture, there is a series of long, thick, articulated, hollow spines. These are so long as, in many specimens, greatly to obscure the cells underneath. In some specimens, on narrow algæ, the front of the cell is much thinner and quite smooth.

Genus LEPRALIA, *Johnston.*

L. vittata.

Cells ovate, separated by irregularly reticulated spaces; front of cell with a broad vitta commencing below the mouth and extending to near the base of the cell, and a row of small perforations on each side close to the margin; mouth arched above, nearly straight below. A roundish or pyriform avicularium above each cell.

On oyster-shell from Western Port.

A beautiful species, at once distinguished from all others by the peculiar anterior vitta.

L. ferox.

Cells confused, coalescent; front pierced with several large apertures; mouth large, with 1–3 small denticles on one side; lower lip occupied by an enormous avicularium.

On Sargassum, Williamstown; on algæ Queenscliff.

This species forms small thick layers encrusting algæ.

The cells are quite undistinguishable. They are pierced by several large openings. The mouth is very large, and usually has on one side two or three sharp denticles. The lower lip forms a large projecting mucro hollowed on one side for an avicularium, and round on the other, from which also frequently projects a mamilliform process. The avicularium faces that side of the cell mouth on which the sharp denticles are situated. In some specimens there are two or three short rounded processes on the upper lip.

L. mucronata.

Cells elongated, of small size, in radiating series. A single median avicularium below the mouth, situated on a projecting mucro, mandible on the anterior surface, pointing directly upwards. A stellate pore in the middle of the cell.

Queenscliff, on shell.

This species is at once distinguished by the central, stellate pore, and by the suboral avicularium. The cells are long, narrow, arranged in radiating series, which are separated by furrows, in the bottom of which can sometimes be distinguished a narrow raised line; sometimes the extreme margins are areolated. The front of the cell is finely granular or frosted; about or below the middle is always a large, round, stellate pore. Immediately below the mouth is a median avicularium, the fixed part of which forms a mucro projecting beyond the lower lip, and the mandible of which is pointed directly upwards and opens in front.

L. diadema.

Cells broad; mouth straight below, arched above, with several spines; a central, roundish pore below the mouth; the edges of the cell obscurely grooved. An avicularium on each side below the mouth, mandible long and pointed outwards; sometimes an avicularium only on one side. Ovicell encroaching on the cell above, with a broad band of vertical beaded lines round the upper margin.

On algæ, Williamstown and other places.

L. ceramia.

Cells obscurely rhomboid or hexagonal, areolated in front; mouth arched above, with three or four spines, straight below; a lunate pore in front below the mouth. A large avicularium at one side of the mouth, mandible long, pointed, directed downwards. Ovicell imbedded in the cell above, sculptured round the upper margin.

Queenscliff, on Laminaria, a single specimen.

This species bears some resemblance to *L. Diadema*, from which it is distinguished by the areolation of the cells and the single avicularium at the side of the mouth, the mandible of which is long and directed downwards.

L. trifolium.

Cells distinct, irregular in shape, frequently oval, granular; mouth trifoliate, the angles of the trefoil frequently produced into spines. Avicularia, when present, by the side of the mouth, mandible long, pointed. Ovicell of moderate size, globular, granular.

On shells, stones, and algæ, probably common.

L. larvalis.

Cells elongated, confused, pierced towards the base by a variable number of foramina; two large openings about the middle of the cell, with a prominent ridge running between them to the point of the much projecting, triangular lower lip; mouth arched above, and frequently with a spine on either side on the angle of junction of the upper and under lips. Avicularia large, on the side of a cell below one of the large openings.

On Sargassum and other algæ, probably common.

L. circinata.

Cells smooth in front, with a row of stelliform pores round the edge, extending also above the mouth; mouth with two or three spines above, lower lip straight with a minute notch. Ovicell adnate to the cell above, very slightly grooved on its upper border.

Queenscliff, on algæ.

Closely resembles *L. Malusii*, from which it differs in the absence of the central lunate pore, in the notch in the lower lip, and the very faint grooving of the ovicell.

L. papillifera.

Cells ovate, distinct, surface covered with numerous hollow granulations or papillæ; mouth usually with several hollow processes and with the lower lip much produced. Ovicell large, round, and covered with hollow granulations like those of the ordinary cells.

Williamstown, on algæ.

This species is distinguished by the whole surface of the cells and ovicells being covered with short, round, irregular papillæ.

L. megasoma.

Cells large, distinct, oblique ; surface smooth or obscurely grooved ; mouth large, edges thickened, lower lip with a shallow notch.

Queenscliff, on mussel shell.

L. crystallina.

Cells large, irregularly hexagonal or rounded above, separated by narrow raised lines ; regularly minutely tubercular in front ; mouth rounded above, lower margin straight, with a deep rounded notch.

Queenscliff, on old shell.

In this very beautiful species the cells are wide, projecting little ; at the bottom of the hollow between contiguous cells there is a narrow raised line ; the front is thickly covered with small, round tubercles, except in the middle, a small portion of which is usually smooth ; these granulations when worn, as they usually are at the apices, leave small foramina.

L. Ellerii.

Cells large, oblique, distinct ; surface cribriform ; lower lip thickened and produced into a variable number of processes ; frequently a median triangular one, and several smaller at the sides ; in some cells the median projection has a small avicularium on one side. Ovicell broad, granular above.

Frequent on algæ and shells.

L. cheilodon.

Cells small, oval, separated by narrow raised lines ; surface granular, usually with a row of small areolations along the margin ; mouth rounded or arched ; lip thickened, and with a broad denticle inferiorly. Ovicell globular, granular.

Williamstown, on shell.

L. schizostoma.

Cells elongated, distinct, arranged in lines ; surface granular, granulations usually larger and closer about the middle of the cell ; mouth semicircular above, lower lip straight, with a deep narrow slit in the middle. Ovicell large, granular.

Williamstown, on shell.

L. marsupium.

Cells small, distinct, arranged in longitudinal lines; upper part, immediately below the lower lip, forming a large rounded pouchlike projection; mouth with several small spines on the upper margin. Ovicell small, globular.

On shell.

Family CELLEPORIDÆ.

Genus CELLEPORA, *Fabricius.*

C. costata.

Cells very irregular, prominent; mouth surrounded by a variable number of thick processes, each bearing an avicularium on its internal surface; processes and cells ribbed. Ovicell small, globular.

Wilson's Promontory and Queenscliff, on zoophytes.

This very distinct and beautiful species occurs in small masses adhering to polyzoa and zoophytes. The cells are prominent; the mouth is arched above, with a deep wide notch in the lower lip, and is surrounded by a variable number of thick processes. In some very prominent cells these are scarcely apparent, the whole thick rim being occupied by the rounded ends of the ribs; in others there are one, two, three or even more prominent thick processes, on the inner surface of each of which is a small avicularium. These processes and the more prominent cells are beautifully fluted longitudinally. The ovicell is small, globular, and smooth, or with a sculptured area in front.

C. platalea.

Cells small, very irregular; mouth very irregular, sometimes with a large rostrum at one side, sometimes with a small one also. Numerous avicularia scattered irregularly over the polyzoary, mandible very long, spoon-shaped. Ovicell rounded, partly immersed, marked with radiating lines.

Queenscliff, on algæ.

A small species allied to *C. exigua.* The cells are very irregular; and the mouth varies greatly; sometimes no rostrum can be made out, at other times there are one or two. It may be recognised by the numerous scattered avicularia with the very long mandible resembling that of *Eschara platalea* or the bill of the spoonbill, and by the small ovicell marked with radiating lines.

C. variolosa.

Cells immersed, confused, indistinct; surface tubercular; mouth large, arched above, with a wide shallow notch below; rostrum large placed irregularly, at a little distance from the mouth of the cell, with a large avicularium on one side. Ovicell large, conical at the summit, areolated.

Queenscliff, on algæ.

A peculiar species, occurring as a thick layer encrusting a narrow, dark sea-weed. The cells are quite coalescent and indistinct, and the whole surface, in fresh portions, is tubercular or, in older cells, deeply areolated or pierced by round openings with smooth edges. These apertures are caused, as occurs also in other polyzoa, by the abrasion of the tubercles. The ovicells are very large, prominent at the summit, which is produced into a conical eminence; the surface is areolated like that of the cells.

C. intermedia.

Cells large, confused, oblique or nearly horizontal, faintly granular; mouth arched above, straight below; usually no distinct rostrum; the cell is prominent below the mouth towards the middle. Avicularia either small and situated on a small rostrum below the mouth, or placed irregularly, with a large spoon shaped mandible. Ovicell small, globular, partly immersed, faintly granular.

Queenscliff.

Of this I have only seen a single specimen. It is in a calcareous stony layer, more than an inch in diameter, attached to the root of a Laminaria and free at its edges. The cells are large, and a good deal resemble those of a *Lepralia*. They are heaped together irregularly, prominent below the mouth towards the middle. In a few of the cells there is a small elevation, an abortive rostrum, immediately below the mouth, with a conspicuous avicularium on its side. There are also one or two avicularia, irregularly situated, with large, long, broad, spoon-shaped mandibles.

Family ESCHARIDÆ.

Genus ESCHARA, *Ray.*

E. obliqua.

Polyzoary expanded, foliaceous; cells obliquely rhomboidal, separated by narrow, raised, smooth lines; surface, tubercular; mouth arched above, with a wide notch below.

Ovicell large, tubercular, traversed by irregular lines like those separating the cells.

Snapper Point, a single specimen.

The shape and arrangement of the cells is such that they form series running in an arched direction laterally.

E. elegans.

Polyzoary expanded, foliaceous, convoluted; cells quadrate, separated by narrow raised lines and arranged in longitudinal linear series; surface granular; mouth arched above, lower lip arched upwards and projecting, a minute curved denticle sometimes on each side of the mouth immediately above the angles. Avicularia, when present, situated at the side of the mouth. Ovicell large, granular, with lines on the surface similar to those separating the cells.

Queenscliff and Portland Bay.

E. dispar.

Polyzoary dividing into branching lobes; cells immersed; mouth spout-like superiorly. An avicularium on one side of the mouth, mandible pointed upwards.

Queenscliff, a single specimen attached to the root of a Laminaria.

E. denticulata.

Polyzoary thin, foliaceous, convoluted; cells quincuncial, wide above, contracted below, separated by narrow, smooth, or minutely crenulated margins; front depressed, granular, with an elongated slit-like opening on either side.

Snapper Point.

The front of the cell is depressed, sloping from the edges; the mouth opening is very large, arched above, straight below; the perforations in the sides are about one-third the length of the cells, the inner margin has a series of sharp denticles, the outer is granular like the rest of the cell. When fresh, the slit-like openings are obscured by the epidermis.

Genus BIFLUSTRA, *D'Orbigny.*

B. fragilis.

Polyzoary much convoluted, thin, brittle, semitransparent; cells quadrate, arched above, aperture partially filled in by a calcareous plate, leaving an oval or elliptical opening; lower margin entire.

King's Island and Port Curtis.

The specimens from King's Island and Port Curtis differ in several respects and perhaps ought to be considered as distinct species. In both, the polyzoary is very much convoluted, thin, cavernous and very brittle. In those from Port Curtis the convolutions are closer, the cells are nearly square, the raised margins separating them thick and strongly crenulated, the calcareous lamina thicker and more granular, and the edge of the oval opening thick and crenulated. In the King's Island specimens, the interstices of the convolutions are narrower; the cells are much more elongated, the raised margins separating them are thin and smooth, the calcareous laminæ very finely granular, and the edges of the elliptical opening smooth and very little or not at all thickened.

This seems to be the species described as *Eschara chartacea* by Lamarck. It may, especially the Port Curtis variety, be identical with the *B. delicatula* described by Busk as occurring recent in Australia, and fossil in the Coralline Crag. From this it differs in the absence of the serrated denticle described and figured as occurring in both recent and fossil specimens, and in the greater extent of, the lamina.

DICTYOPORA, *New Genus.*

Polyzoary erect, rigid, expanded, reticulate, attached by a flexible stem. Cells opening on both sides.

Dictyopora differs from *Retepora* and *Petralia* in having the cells opening on both sides, and from *Eschara* in being fenestrated and attached to a flexible stem.

The genus *Adeona* of Lamouroux contains two species *A. grisea* and *A. foliifera*, differing chiefly in the former being fenestrated, and the latter entire. *A. grisea* ought probably to be referred to the present genus.

D. cellulosa.

Polyzoary expanded, cavernous; fenestræ round, small, much narower than the interspaces. Cells distinct; mouth nearly circular. A large avicularium on the front of each cell below the mouth, mandible pointed obliquely upwards and outwards.

Queenscliff.

Of this species I have two specimens which were drawn up on a fishing line. The larger is nine inches high, and at its thickest part sixteen inches in circumference. The polyzoary forms an expanded lamina twisted and united, so as to form large cavernous compartments, mostly extending

from the circumference to the base; these compartments vary at their widest parts from one to three inches. The flexible stem is two inches high, an inch and a-half in diameter immediately above the root, and almost an inch at its junction with the rigid polyzoary; it is rough and irregularly transversely annulated. There are no ridges or prolongations of the stem on any part of the polyzoary.

Genus RETEPORA, *Imperato.*

R. porcellana.

Polyzoary expanded, waved or convoluted, thick; fenestræ elongated, about as wide as the subcylindrical interspaces. Cells oval or rhomboidal, smooth. An avicularium towards the middle of a cell, mandible short, generally directed vertically or nearly so, sometimes obliquely; occasionally there is also an avicularium placed obliquely on or below the lower lip. Dorsal surface vibicate.

This is distinguished from all the other Victorian species which I have seen by the size of the fenestræ which are as wide as the interspaces, and by the interspaces being thick and subcylindrical.

R. granulata.

Polyzoary thick, expanded, foliaceous, convoluted; fenestræ small, short, oval, not so wide as the interspaces. Cells ovate, whole surface granular. Ovicell immersed, granular. Dorsal surface faintly vibicate.

This species may at once be distinguished from the last by the different form and size of the fenestræ, which are much smaller and rounded. The whole surface is finely granular, and the granulations give to the edges of the fenestræ a crenulated appearance.

R. fissa.

Polyzoary expanded, foliaceous; fenestræ round or slightly elongated, about the same width as the interspaces. Cells ovate, separated by narrow raised lines, with an avicularium towards the centre, the mandible directed downwards and outwards. Ovicell globular, smooth, with a slit in front. Dorsal surface vibicate.

In this species the polyzoary is much thinner than in the other two here described, and the fenestræ which are small are of about the same width as the interspaces. From *R. monilifera* it is at once distinguished by the difference in the ovicell.

PETRALIA, *New Genus.*

Polyzoary erect, expanded, stony, reticulate, formed of a single layer of cells, placed horizontally side by side, and distinct through the whole thickness of the polyzoary.

The only other genus of Escharidæ, with a reticulate polyzoary, the cells of which are arranged in one plane, is *Retepora*. The arrangement of the cells is very different in the two genera. In *Retepora* they are oblique, and rest on a common calcareous base, while in *Petralia* there is no such basis, but each cell is as distinct on the back of the polyzoary as in the front.

P. undata.

Fenestræ elliptical; a large avicularium at the base of each in front. Cells quadrate, expanded above, slightly narrowed at the middle and below, separated by narrow raised lines; front areolated; mouth circular, with a short, broad, transverse avicularium immediately below the lower lip; behind, the cells are quadrate, deeply areolated, and separated by deep channels, at the bottom of which is a narrow elevated ridge. Ovicell large, granular; frequently one or two immovable processes surmounted by sessile avicularia rise from various parts of the ovicell, and there is generally one on each side of the mouth of the cell above which the ovicell is situated.

Queenscliff; Portland, Miss F. Birkett.

Family CRISIIDÆ.

Genus CRISIA, *Lamouroux.*

C. setosa.

Cells 6–10 in an internode, closely adnate, upper extremity usually free for a very small extent; mouth circular, entire; cell prolonged outside the mouth, into a stout projection to which is articulated a long hollow calcareous spine. Surface finely and minutely granular. Branches usually given off between the first and second pairs of cells in an internode. Joints brown.

A small species, parasitic on algæ and zoophytes.

C. biciliata.

Cells two in an internode; outer extremity free for a short distance; mouth circular; from the outside of each cell arise two long, hollow, jointed, filiform processes. Surface granular. Joints of polyzoary and cilia light brown or white.

Williamstown, Mr. Maplestone.

Another two-celled species occurs here, identical with that described and figured as *Crisidia Edwardsiana*, by D'Orbigny.* The present species is at once distinguished by the presence of two long, jointed cilia on each cell, there being but one in the former. In *C. Edwardsiana* also, the cells are much more produced, and the cilia are situated much further down the back of the cells. Another point of distinction, though not of much value, is that the joints are black in *C. Edwardsiana*, and light brown or the same colour as the cells in *C. biciliata*.

Family IDMONEIDÆ.

Genus HORNERA, *Lamouroux.*

H. foliacea.

Polyzoary reticulate, expanded, foliaceous, convoluted; branches subcylindrical; fenestræ large, oval or quadrate; openings of cells circular, exserted, margin divided into several sharp teeth; interstices finely granular; dorsal surface sulcate and granular.

Portland Bay; Wilson's Promontory; Tasmania.

This very beautiful species forms an expanded, foliaceous polyzoary flabelliform in young specimens, expanded and convoluted in those of older growth. The largest specimens attain a height of one or two inches. The fenestræ are large, generally quadrate, oval, or elliptical, broader than the subcylindrical branches. The form of the cell varies according to age. In a young small flabelliform specimen, the central cells have several serrations, the serratures of the lateral cells are very long and sharp, more especially at the outer edge which is produced. In older specimens, the serratures of the cells become worn off, so that the central ones appear to have the mouth scarcely if at all exserted and entire, while the lateral (those projecting on the edges of the fenestræ) have the outer lip produced, smooth, or slightly jagged. The depth of the posterior sulci and the prominence of the anterior ridges, as well as the distinctness of the granulations vary a good deal.

This is possibly the species alluded to by Busk, under the provisional name of *H. Gouldiana*, as having been brought from South Australia.

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* Voyage; Zoologie, Zoophytes, 8, t. I. 4—8.

LIST OF VICTORIAN POLYZOA.

Class—POLYZOA.

Order I. PHYLACTOLÆMATA, *Allman.*

Suborder I. LOPHOPEA, Allman.

Family 1. PLUMATELLIDÆ.

Genus 1. Plumatella, *Lamarck.*

1. P. Aplinii, *McG.*

Genus 2. Fredericella, *Gervais.*

1. F. —— *sp.**

Order II. GYMNOLÆMATA, *Allman.*

Suborder I. CHEILOSTOMATA, Busk.

Family 1. CATENICELLIDÆ.

Genus 1. Catenicella, *Blainville.*

1. C. lorica, *Busk.*
2. C. ventricosa, *Busk.*
3. C. hastata, *Busk.*
4. C. alata, *Thomson.*
5. C. plagiostoma, *Busk.*
6. C. intermedia, *McG.*
7. C. cribraria, *Busk.*
8. C. rufa, *McG.*
9. C. margaritacea, *Busk.*
10. C. formosa, *Busk.*
11. C. Hannafordi, *McG.*
12. C. perforata, *Busk.*
13. C. elegans, *Busk.*
14. C. Dawsoni, *Thomson.*
15. C. Buskii, *Thomson.*
16. C. cornuta, *Busk.*
17. C. crystallina, *Thomson.*
18. C. carinata, *Busk.*
19. C. aurita, *Busk.*
20. C. geminata, *Thomson.*

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* A species of Fredericella was found by Mr. Aplin some years ago in a creek at Muckleford, near Castlemaine. It has not yet been described.

Family 2. CELLULARIIDÆ.

Genus 1. Cellularia, *Pallas.*
1. C. cuspidata, *Busk.*

Genus 2. Scrupocellaria, *Van Beneden.*
1. S. scrupea, *Busk.*
2. S. cervicornis, *Busk.*
3. S. ornithorhynchus, *Thomson.*
4. S. cyclostoma, *Busk.*

Genus 3. Emma, *Gray.*
1. E. cyathus, *Thomson sp.*
2. E. crystallina, *Gray.*
3. E. cervicornis, *McG.*
4. E. tricellata, *Busk.*
5. E. Buskii, *Thomson sp.*

Genus 4. Canda, *Lamouroux.*
1. C. arachnoides, *Lamx.*

Family 3. SALICORNARIIDÆ.

Genus 1. Salicornaria, *Cuvier.*
1. S. hirsuta, *McG.*
2. S. gracilis, *Busk.*
3. S. tenuirostris, *Busk.*

Genus 2. Nellia, *Busk.*
1. N. oculata, *Busk.*

Genus 3. Onchopora, *Busk.*
1. O. hirsuta, *Busk.*

Family 4. SCRUPARIIDÆ.

Genus 1. Scruparia. *Oken.*
1. S. chelata, *L. sp.*

Family 5. CABEREIDÆ.

Genus 1. Caberea, *Lamouroux.*
1. C. rudis, *Busk.*
2. C. Boryi, *Audouin.*
3. C. lata, *Busk.*

Family 6. BICELLARIIDÆ

Genus 1. Bicellaria, *Blainville.*
1. B. grandis, *Busk.*
2. B. gracilis, *Busk.*
3. B. tuba, *Busk.*
4. B. turbinata, *McG.*

Genus 2. Halophila, *Gray.*
1. H. Johnstoniæ, *Gray.*

Genus 3. Bugula, *Oken.*
1. B. neritina, *L. sp.*
2. B. robusta, *McG.*
3. B. dentata. *Lamx sp.*
4. B. cucullata, *Busk.*
5. B. avicularia ? *Pall sp.*

Family 7. FLUSTRIDÆ.

Genus 1. Flustra, *L.*
1. F. denticulata, *Busk.*

Genus 2. Carbasea, *Gray.*
1. C. episcopalis, *Busk.*
2. C. indivisa, *Busk.*
var. cyathiformis, *McG.*
3. C. pisciformis, *Busk.*
4. C. dissimilis, *Busk.*
5. C. elegans, *Busk.*

Genus 3. Diachoris, *Busk.*
1. D. spinigera, *McG.*
2. D. Magellanica, *Busk.*

Genus 4. Spiralaria, *Busk.*
1. S. florea, *Busk.*

Family 8. FARCIMINARIIDÆ.

Genus 1. Farciminaria, *Busk.*
1. F. dichotoma, *V. Suhr. sp.*

Family 9. GEMELLARIIDÆ

Genus 1. Dimetopia, *Busk.*
1. D. spicata, *Busk.*
2. D. cornuta, *Busk.*

Genus 2. Calwellia, *Thomson.*
1. C. bicornis, *Thomson.*

Genus 3. Didymia, *Busk.*
1. D. simplex, *Busk.*

Family 10. HIPPOTHOIDÆ.

Genus 1. Hippothoa, *Lamouroux.*
1. H. crassa, *McG.*
2. H. catenularia, *Jameson, sp.*
3. H. divaricata, *Lamx.*
4. H. distans, *McG.*

Genus 2. Alysidota, *Busk.*
1. A. ciliata, *McG.*

Genus 3. Ætea, *Lamouroux.*
1. A. anguina, *L. sp.*
2. A. dilatata, *Busk.*

Family 11. MEMBRANIPORIDÆ.

Genus 1. Membranipora, *Johnston.*
1. M. membranacea, *L. sp.*
2. M. pilosa, *L. sp,*
3. M. umbonata, *Busk.*
4. M. mamillaris, *McG.*
5. M. cervicornis, *Busk.*
6. M. perforata, *McG.*
7. M. Lacroixii, *Savigny.*
8. M. Woodsii, *McG.*
9. M. dispar, *McG.*
10. M. lineata, *L. sp.*
11. M. ciliata, *McG.*
12. M. serrata, *McG.*
13. M. armata, *McG.*
14. M. falcata, *McG.*

Genus 2. Lepralia, *Johnston.*
1. L. vittata, *McG.*
2. L. Brogniartii, *Audouin.*
3. L. mucronata, *McG.*
4. L. ferox, *McG.*
5. L. diadema, *McG.*
6. L. canaliculata, *McG.*
7. L. trifolium, *McG.*
8. L. lunata, *McG.*
9. L. larvalis, *McG.*
10. L. monoceros, *McG.*
11. L. ciliata, *L. sp.*
12. L. excavata, *McG.*
13. L. Malusii, *Audouin, sp.*
candida, *McG.*
14. L. circinata, *McG.*
15. L. Ellerii, *McG.*
16. L. papillifera, *McG.*
17. L. megasoma, *McG.*
18. L. pertusa, *Esper.*
19. L. elegans, *McG.*

20. L. marsupium, *McG.*
21. L. cheilodon, *McG.*
22. L. schizostoma, *McG.*
23. L. hyalina, *L. sp.*
24. L. crystallina, *McG.*

Family 12. CELLEPORIDÆ.

Genus 1. Cellepora, *Fabricius.*
1. C. pumicosa, *L. sp.*
2. C. fusca, *Busk.*
3. C. alata, *Lamk.*
4. C. mamillata, *Busk.*
5. C. exigua, *McG.*
6. C. platalea, *McG.*
7. C. costata, *McG.*
8. C. variolosa, *McG.*
9. C. intermedia, *McG.*
10. C bispinata, *Busk.*

Family 13. ESCHARIDÆ.

Genus 1. Eschara, *Ray.*
1. E. obliqua, *McG.*
2. E. elegans, *McG.*
3. E. platalea, *Busk.*
4. E. lichenoides, *Milne Edwards.*
5. E. decussata, *Milne Edwards.*
6. E. dispar, *McG.*
7. E. denticulata, *McG.*

Genus 2. Biflustra, *D'Orbigny.*
1. B. delicatula? *Busk.*
2. B. fragilis, *McG.*

Genus 3. Petralia, *McG.*
1. P. undata, *McG.*

Genus 4. Retepora, *Imperato.*
1. R. cellulosa? *Lamouroux.*
2. R. monilifera, *McG.*
3. R. porcellana, *McG.*
4. R. fissa, *McG.*
5. R. granulata, *McG.*
6. R. phœnicea, *Busk.*

Genus 5. Dictyopora, *McG.*
1. D. cellulosa, *McG.*

Suborder II. CYCLOSTOMATA, Busk.

Family 1. CRISIIDÆ.
Genus 1. Crisia, *Lamouroux.*
1. C. acropora, *Busk.*
2. C. setosa, *McG.*
3. C. Edwardsiana, *D'Orbigny.*
4. C. biciliata, *McG.*

Family 2. IDMONEIDÆ.
Genus 1. Hornera, *Lamouroux.*
1. H. foliacea, *McG.*
Genus 2. Idmonea, *Lamouroux.*
1. I. radians, *Milne Edwards.*

Family 3. DIASTOPORIDÆ.
Genus 1. Discoporella, *Gray.*
1. D. hispida, *Johnston, sp.*

Suborder III. CTENOSTOMATA, Busk.

Family 1. SERIALARIIDÆ.
Genus 1. Serialaria, *Lamarck.*
1. S. cornuta, *Lamx, sp.*
2. S. crispa, *Lamarck.*

ART. XXII.—*A Sketch of a New Theory of the Oceanic Tides, based upon examination of the causes assigned to exceptional "tidal" waves.* By MR. J. WOOD BEILBY.

[Read by Mr. Rawlings, 26th November, 1868.]

In this paper Mr. Beilby sought to demonstrate that the earth's surface was liable to regular changes by the relative elevation or depression of areas of sea surface in the northern and southern hemispheres, disproportionately, as ascertained by barometrical observations, and that redundance of matter thus unequally accumulated with excessive local precipitation and congelation in areas within polar regions, must tend to alter the symmetrical figure, and hence the centre of gravity and axis of rotation of a spheriod poised in space, and relatively change the position of her equator with reference to the plane of her orbit; thus accomplishing by terrestial agencies, results hitherto ascribed to lunar and solar gravitation.